

SENS. ALEXANDER (R-TENN.) AND MURRAY (D-WASH.)—THE IMPROVING HEALTH INFORMATION TECHNOLOGY ACT (S. 2511)

If you asked doctors, hospitals, or patients who want access to complete and useful patient records to both deliver care and understand more about their own health—and I think that's most Americans—whether they think this bill is important, they would say yes.

This bill takes several steps to get health records flowing between doctors, hospitals, and patients to help realize the promise of health information technology by turning these systems from something that doctors and hospitals dread into something that actually helps patients.

The PRESIDING OFFICER. The Senator from Florida.

Mr. NELSON. Mr. President, I ask unanimous consent to speak for up to 20 minutes.

The PRESIDING OFFICER. Without objection, it is so ordered.

THE PRESIDENT'S SPACE PROGRAM BUDGET

Mr. NELSON. Mr. President, I come to the floor to speak about the President's proposal with regard to our space budget, the civilian space program, and NASA. Of course we have many other space programs, primarily national security, but now there is a commercial space program. We are seeing the burgeoning commercial space industry in the NASA budget. We are amazed by the rockets which can take the first stage—instead of throwing it away when it lands in the Atlantic Ocean after a launch from Cape Canaveral—under powered flight, even without parachutes, can come back and land on a specific spot, just as SpaceX did in its first stage in a launch about 2 months ago. We are seeing commercial space.

The fact that these things we carry around in our pockets that we loosely refer to as phones that know exactly where we are at any time is as a result of a constellation of satellites up there called GPS that triangulate and calculate exactly where we are. It is absolutely amazing to me that my latest gadgetry acquisition—a Fitbit—can so sensitively understand what my heart rate is at any moment, can measure distance, and gives me all kinds of information about the functioning of the human body.

Well, this didn't just accidentally appear. Where in the world did a lot of this come from? It came from the space program. I wish to talk about that, but first I want to underscore something. Other than its pioneering, for example, of increased investments in aeronautics, which is the first “A” in “NASA”—the National Aeronautics and Space Administration—there are other parts of the President's proposal that have been left behind in the visionary appropriations bill we passed back in the middle of December which has sent us on a course that we are going to Mars. We are preparing to go to Mars, and that is a long way. In

order to sustain human life and go all the way there—land, survive, reignite off the surface of Mars—and, by the way, I commend the Matt Damon movie “The Martian.” The author of the book which the movie came from actually consulted with a number of folks, including one of my crewmates, on the propulsion, how to get to Mars a lot quicker. That propulsion uses magnets and plasma as its fuel and thrust to get us to Mars, and instead of the conventional 8 to 10 months, we could get there in as little as 39 days. But those are to-be-developed technologies.

Let me mention a couple of things we are developing. Folks often argue about the NASA budget, which back in the lunar days the Apollo Program was as much as 4 percent of the entire Federal budget. Now it is about one-half of 1 percent. In the process of divvying up the dollars out here, we pull and tug because people will ask: Why do we need to go to Mars? Why do we need to go to an asteroid in preparation to go to Mars? Why do we need a space program when we have so many needs here on Earth? That is a legitimate question. What is the legitimate answer? Do you appreciate the fact that we have MRIs and CT scans? MRIs—magnetic resonance imaging—and CT scans—computer-aided tomography—technologies that are used routinely today to help us so much in a diagnosis of what is wrong or what is right in our own human bodies and is part of this medical miracle that we know as modern medicine—they came straight out of the space program.

In the 1960s, NASA had to find a safe landing spot for the Apollo lunar lander amid all of that Moon surface and all of that dust. So what happened was the engineers at JPL out in California developed a digital scanning process using high-frequency sound waves, magnets, and computers. In addition to making six successful Moon landings, this technology was tweaked, adapted, improved, and it led to CT scans and MRIs.

How about robots in the use of modern medicine? How about robots in the use of the manufacturing process? Well, my colleagues will remember the one thing on the space shuttle that had the name of another country; it was the Canadarm. It was the robotic arm that was birthed in the cargo bay of the space shuttle. It was used to deploy, maneuver, and capture payloads. It has now been the forerunner of the neuroArm, a surgical device that has successfully performed dozens of tumor removals by robotic surgery.

Now, any of the males around here over the age of 50 ought to be concerned about prostate cancer. They have a robot named DA Vinci that is built in California, even though it is named after Leonardo da Vinci, and this robotic device, with a small incision—six times—can go in and, with some of this precise photography that was developed for these cameras,

robotically remove, in this case, the prostate cancer by removing the prostate without damaging the nerves and without cutting the human body open, which takes so much more time to heal, instead of just sticking six holes in. That came directly out of the space program. It is being used to develop an image-guided autonomous robot for use in the early detection of breast cancer.

Let me give my colleagues another idea. When we get on a modern airliner today and we look out the window and we look at that swept-back wing, what do we see out there on the tip of the wing? The wing doesn't just stop as it normally does; it curves up. This is called a winglet. The winglets have these upturned features. They save billions of dollars in fuel costs.

Now, with NASA technology at the Langley Research Center and now the tests conducted at the Dryden Flight Center—now named, after the first astronaut on the moon, the Armstrong Flight Center—this winglet technology was released to Boeing, and it has saved the airline industry more than 2 billion gallons of jet fuel, and it has saved more than \$4 billion in jet fuel costs and a reduction of almost 21.5 million tons of carbon dioxide emissions, just by the design of the wing. That technology came directly out of NASA.

Here is another example. All of this is coming back to this: Why go to space? Well, we go to space because our nature is that we are explorers and adventurers. We go there because we haven't been there. We go there to explore. Our nature is one of pioneers. The frontier is now not westward, as it was in the beginning of this country, but upward. So that is certainly a reason to have the space program, but let me tell my colleagues more of how it applies to our daily lives.

How about fortified baby formula? Early 1980s research on regenerative ecosystems led to a method of algae-based food supplements that provide the long-chain polysaturated fatty acids that support brain and eye development and function. So this led to a spinoff product called Formulaid, which was patented in 1996. It can now be found in over 90 percent of infant formula sold in the United States as well as those sold around the world.

I will give another example: image sensors—image sensors to enhance cell phone cameras. In the 1990s, a NASA team had been improving digital image sensors in order to miniaturize cameras on spacecraft while maintaining the scientific image quality. So this was spun off into commerce, and the company that commercialized the technology has shipped over 1 billion sensors for use in applications such as—now, does this sound familiar—digital cameras, camera phones, web cameras, automotive cameras. They are even developing something where you will swallow a pill; only it is not a pill. It is an ingestible camera for imaging the patient's gastrointestinal tract.

Let me tell my colleagues about another one. I had a visit from Tallahassee Community College today. They showed me what they could do with a 3-D printer. I ask unanimous consent to show this in front of the Senate.

The PRESIDING OFFICER (Ms. AYOTTE). Without objection, it is so ordered.

Mr. NELSON. We are doing this on the space station right now. We are putting together tools so that if we don't have a tool in space or if we were on the long journey to Mars and we did not have a tool that we needed to repair something, we could send the messages up to the spacecraft and 3-D print the tools that we need. So long-term space missions like the one to Mars are going to benefit from this on-board manufacturing capability.

Spare parts—what happens if we get up there and we don't have enough? Well, we can print it. Engineers are even experimenting with creating a completely 3-D printed high-performance rocket engine. Can my colleagues believe that? So that would advance manufacturing technologies that could benefit a number of us right here on the face of the Earth.

So the excitement of this—even though some would look at the President's request for NASA and see that it is \$600 million over what he requested last year, but it is actually almost flat-line to what we actually appropriated. Don't be discouraged by that because in this sense the excitement is gathering as we are about to launch humans—Americans on American rockets. That is going to occur next year, as we send crews to and from the International Space Station. As a result, we therefore do not have to rely on the proven Russian Soyuz that gets our crews to and from today. Now we will have the capability of not only transporting cargo to and from but our American astronauts.

Even though the President's request falls short in some areas, I think the President's request has been overcome with what we have done here in the Congress, with a substantial increase in this current fiscal year over and above last year and with the excitement of human space flight again within our grasp on American rockets, as well as this excitement of defining, creating, and manufacturing new technologies for space flight that will benefit us here on the face of the Earth.

If it sounds like I am a cheerleader, indeed I am a cheerleader. When I see the miracles of modern medicine, when I see the increased capabilities of exploring the heavens and now almost back to the original light emitted from the big bang, and when we start to uncover the new discoveries that expand our horizons, indeed, I am a cheerleader. For that, I am grateful.

I commend the Senate to keep this space program going at a fast pace as we increasingly get back into the total business, both manned and unmanned, of space exploration.

Madam President, I yield the floor.

The PRESIDING OFFICER. The Senator from Arkansas.

(The remarks of Mr. COTTON pertaining to the introduction of S. 2123 are printed in today's RECORD under "Statements on Introduced Bills and Joint Resolutions.")

The PRESIDING OFFICER. The Senator from Connecticut.

GUN VIOLENCE

Mr. MURPHY. Madam President, over the course of the last year and a half, I have come down to the floor fairly regularly to tell some simple stories about victims of gun violence all across the country. The idea is that if the overwhelming data of those killed through gun violence—31,000 a year; 2,600 a month; 86 a day—if these mind-numbing numbers don't move this body to action, then maybe the voices of the victims, the stories of the victims of gun violence may eventually thaw the ice of this Congress and cause us to act in some way, shape or form to reduce this scourge of gun violence—whether it be tightening the Nation's gun laws, which are the loosest in the world, whether it be to pass mental health legislation that will address those who are wrestling with demons manifested eventually in gun homicides or whether it be giving more resources to gun enforcement to simply enforce the laws on the books. We have done nothing. We have done nothing since the murders of Sandy Hook, CT, to address this epidemic of gun violence. It is about time that we do.

On New Year's Eve, I spent most of that day tweeting out the 370-plus instances of mass shootings over the course of 2015. Think about that for a second. There were more mass shootings in 2015 than there were days in the year. Just to be honest, I will tell you what I believe to be a mass shooting. I am talking about a shooting in which there were more than four people shot. If there were more than four people shot in your neighborhood, that would probably be something you would be talking about, that would probably rise to the level of being something serious enough to change behavior or to call for a change in policy. There were 370 instances in 2015 where more than 4 people were shot at one given time—more than one per day. So I tweeted out to every single one of them on the day before the year turned to 2016 just to give people a sense all in one place of how big this problem of mass shootings is. Of course, that is only the tip of the iceberg.

If on the average day there are 4, 5, 6 or 7 people being shot in episodes of mass violence, there are another 80 that are killed through other episodes of gun violence. Many of those are suicides, but many of those are just the day-to-day gun violence incidents that happen across this country, most of which happen in our cities.

So I want to share a few of those stories here with you today.

A lot of attention gets paid to those who die in episodes of mass violence. This is a binder that is basically full of the stories of the individuals who were killed in mass shootings over the past couple of years. This doesn't even begin to account for the individuals who are killed every day on the streets of Chicago and New Haven and Los Angeles and New Orleans, people such as Jonathan Aranda, who was 19 years old when he was killed just before Christmas of 2015. He was killed in the morning hours of December 8. He had just graduated from Eli Whitney Technical High School, which is located in Hamden, CT.

His cousin said:

He was getting out of work, stopped at a friend's house to talk about cars and this senseless act of violence happened. He was quick to lend a hand when you needed help without asking for anything in return. He worked a third shift job to come home, rest and help at home.

His younger sister, Genisis, said that her brother was "a humble and loving person, he was a person who never picked fights. He was quick to lend a hand when you needed help without asking for anything in return."

Jonathan's cousin Edgar said he was a "very, very likeable kid. . . . He didn't have a problem with anybody."

The community has been devastated by this loss. He was liked by everybody. He cared deeply for his family. Jonathan was 19 years old when he was killed after stopping at a friend's house—after getting off of work—to talk about cars.

Treesa Wiley was killed just a few days ago in Rockford, IL. She was fatally shot while she was visiting a friend in her home. An unknown person forced entry into the home and shot Wiley and her friend. She lived paycheck to paycheck, but she was still immensely generous with her friends and family, showering them with love, attention, and gifts.

Her uncle said of Treesa:

She didn't have children herself, but every child that she met was her child. That's why she enjoyed that work so much. She enjoyed giving back to the community because it had given her so much."

Her friends described her as "bubblely," "angelic," and "lovable." Her favorite color was purple. Her favorite team was the Green Bay Packers. She loved red lipstick. She had overcome a learning disability to get a 2-year degree. She was killed while she was studying to get her bachelor's degree.

A friend said:

She was the most loving and honest friend you could hope for. . . . I can't think of one person who didn't like Treesa.

Raven White was 16 years old when about a month ago she was killed in Birmingham, AL. She was fatally shot in her car in the early morning hours of January 8. It looks as if it was a robbery. She was a junior in high school, and she was 6 months pregnant.

Her mother said Raven was very outgoing.